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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,256	07/14/2003	Timo Kalevi Korpela	Korpela 1	6902

7590 03/08/2007

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EXAMINER	
KHANNA, HEMANT	
ART UNIT	**PAPER NUMBER**
1654	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/619,256	KORPELA ET AL.	
	Examiner	Art Unit	
	Hemant Khanna	1654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-17* is/are pending in the application.

4a) Of the above claim(s) *9-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-8 and 15-17* is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to Applicant's remarks filed December 18, 2006. The amendment to claim 2, 5, and 15 is acknowledged. Acknowledgement is made of claims 9-14 now withdrawn from consideration as being drawn to a non-elected invention in the Office Action issued by the Examiner filed on October 12, 2006.

Claims 1-3, 5-8, and 15-17 are pending.

Specification

2. (Withdrawn) Objection to the description for failure to include SEQ ID NO:'s after all amino acid sequences is withdrawn based on the amendments to the specification.

Claim Objections

3. (Withdrawn) Objection to claims 2, and 17 under 37 CFR 1.75(c), as being of improper multiple dependent form is withdrawn in view of Applicant's amendments to claim 2.

4. (New) Objection to claims 3, 5 and 8 for failure to include a sequence identifier indicated by SEQ ID NO:s after amino acid sequences in the claims. See 37 CFR 1.821 (d).

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. (Withdrawn) Rejection of claims 15-16, under 35 U.S.C. 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which the Applicant regards as the invention is withdrawn in view of Applicant's amendments to claim 15.

7. (New) Claims 1-3, 5-8, 15-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "corresponding to the structure of the active sites of the amino-terminal extension". It is not clear whether this limitation is intended to structurally limit the antimicrobial peptide by reciting its presence at the N-terminus or whether the intended structure of a sequence of the antimicrobial peptide is being correlated with the structure of the active-site of an amino-terminal extension. Thus claim 1 is indefinite. Claims 2-3, 5-8, 15-17 depend from claim 1, and therefore are indefinite.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. (Maintained) Claims 1-3, and 17 rejected under 35 U.S.C. 102(b) as being anticipated by Hultgren et al. (USPN 6,001,823) is maintained for the reason set forth in the previous Action and for the reasons set forth below.

The claims are drawn to an antimicrobial peptide comprising the sequence of Ala-Thr-Ala-Thr-Leu-Val represented by SEQ ID NO:1.

The Applicant argues that Hultgren et al discloses a sequence that comprises SEQ ID NO: 1 as inhibitors of pilus assembly located at the C-terminal of the pilus subunit. The Applicant respectfully submits that the instantly claimed SEQ ID NO: 1 corresponds to the amino terminal end.

The Applicants arguments have been considered but not found persuasive. To the extent that the Applicants define the antimicrobial peptide comprising SEQ ID NO: 1 as corresponding to the structure of the amino-terminal extension of subunit assembly of adhesive organelle, the structure of the amino terminal extension of the subunit assembly is inherently encompassed by the sequence of the antimicrobial peptide. The teachings of Hultgren will inherently result in the claimed correspondence with the structure of an amino terminal extension of subunit assembly. Further, the Examiner respectfully submits that intended use of the antimicrobial peptide is not given patentable weight. The MPEP states "[I]f the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for

example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction....where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention, the preamble is not a claim limitation". See MPEP 2111.02. Since the statements regarding preventing self-polymerization are intended use, they are not given any patentable weight.

Rejection is maintained.

5. (Withdrawn) Claim 5 rejected under 35 U.S.C. 102(b) as being anticipated by Wang L. et al (WO 02/077183) is withdrawn in view of Applicant's amendment to claim 5.

6. (New) Claims 6-8 rejected under 35 U.S.C. 102(b) as being anticipated by Hochheimer et al. (Eur. J. Biochem (1995) 234: 910-920) is withdrawn in view of Applicant's arguments fully considered and persuasive. However, upon further reconsideration a new ground of rejection is made in view of the reference of Macino et al (WO 0032785)

The claim is drawn to a peptide comprising the sequence of TTKL represented by SEQ ID NO:4.

The Applicant argues that Hochheimer et al discloses a sequence that comprises SEQ ID NO: 4 only when the sequence of peptides 5 and 6 in the publication are read one after the other.

The Applicants arguments have been considered and found persuasive. However upon further reconsideration in view of the reference of Macino et al, the claims 6-8 stand rejected. Macino et al disclose a sequence, with SEQ ID NO: 132 and Registry # 273408-29-0, that comprises the sequence of SEQ ID NO: 4, and aligns with the instant sequence at positions 9-12, thus meeting all the limitations of claims 6-8. To the extent that the Applicant utilized the same sequence denoted by SEQ ID NO:4 as was utilized by the teachings of Macino et al, the teachings of Macino et al would inherently result in the claimed properties of inhibiting polymerization of Dr. haemagglutinin.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. (New) Claims 1-2, 6-7, and 15-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

To provide evidence of possession of a claimed genus, the specification must provide sufficient distinguishing identifying characteristics of the genus. The factors to be considered include disclosure of compete or partial structure, physical and/or chemical properties, functional characteristics, structure/function correlation, methods of making the claimed product, or any combination thereof. In this case, claims 1-2, 6-7, and 15-17 recite an antimicrobial peptide or inhibitor with unknown sequence that correlates to a tertiary structure of an active site formed from the assembly of surface organelle and intended use only. As the genus of antimicrobial peptides, encompasses any random length, without any common sequence core, and with any secondary structure, as long as it corresponds to the tertiary structure of the active site formed from the assembly of surface organelle also with unknown structure, one skilled in the art would conclude that the disclosure of SE ID NO: 1, 4, and 5 is not representative of the undefined genus recited in the claims. Accordingly, in the absence of sufficient recitation of distinguishing identifying characteristics, the specification does not provide adequate written description of the claimed genus. Therefore, the inventor, at the time the application was filed was not in possession of the broad genus comprising "antimicrobial peptides" or "inhibitors" needed to practice the claimed invention.

Vas-Cath Inc. v. Mahurkar, 19USPQ2d 1111, clearly states that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention*. The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed.*" (See page 1117.) The

specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See *Vas-Cath* at page 1116).

With the exception of the sequence that is the same as in SEQ ID NO:1, 4 and 5, the skilled artisan cannot envision the detailed structure of the claimed peptides, and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation.

Therefore, only the sequence that is the same as that of SEQ ID NO:1, 4 and 5, but not the full breadth of the claims, meets the written description provision of 35 U.S.C. §112, first paragraph. Applicant is reminded that *Vas-Cath* makes clear that the written description provision of 35 U.S.C. §112 is severable from its enablement provision (see page 1115).

9. Claims 1-2, 6-7, 15-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The specification, while being enabling for using SEQ ID NO:1, 4 and 5 for the in vivo use as antimicrobials, does not provide enablement for all in vivo uses for all undefined antimicrobial peptides that correspond to the tertiary structure of the active site formed from the assembly of surface organelle, also with unknown structure. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with claim 1.

The factors to be considered in determining whether undue experimentation is required are summarized In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

The Court in Wands states: "Enablement is not precluded by the necessity for some experimentation such as routine screening. However, experimentation needed to practice the invention must not be undue experimentation. The key word is 'undue,' not 'experimentation.' " (Wands, 8 USPQ2d 1404). Clearly, enablement of a claimed invention cannot be predicated on the basis of quantity of experimentation required to make or use the invention. "Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations." (Wands, 8 USPQ2d 1404). The factors to be considered in determining whether undue experimentation is required include: (1) the quantity of experimentation necessary, (2) the amount or direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. While all of these factors are considered, a sufficient amount for a *prima facie* case is discussed below.

Nature of the invention. The instant invention is to antimicrobial peptides that correspond to the structure of the active sites of amino-terminal extension of subunits, wherein the antimicrobial peptide is capable of preventing self-polymerization of equal peptide units.

Breadth of the claims. According to the language of the claims, the use of the antimicrobial peptide can be extrapolated to any and all peptides that correspond to the structure of the active site of the amino-terminal extension of subunits.

State and un/predictability of the prior art. The claimed subject matter is lacking in predictability. While examples in the art (WO 0032785) exist for the use of peptides that comprise the four consecutive amino acid sequence, TTKL, as in SEQ ID NO:4, the facts indicate that TTKL as disclosed in the reference encodes a helicase domain. Specifically, the state of the prior art as exemplified by Macino indicates that two oligopeptides, the instant and one taught by the reference, have different functions although they are capable of corresponding to the structure of the active sites of amino-terminal extensions.

Given that determining any and all uses of oligopeptides with similar sequences and intended structure correlation is empirical and unpredictable in nature, it flows logically that one would be unduly burdened with experimentation to determine any and all the pharmaceutical uses of all oligopeptides encompassed by the antimicrobial peptide, which would be impossible in many lifetimes.

Working examples. While the only working examples given in the specification are limited to the "use" of SEQ ID NO: 1, 4 and 5 for antibacterials, there is no suggestion as to what the specific uses of any and all uses of other antimicrobial peptides is, given the only correlation with the intended tertiary structure of the active-site amino terminal extension.

Guidance in the specification. The specification provides little guidance regarding the use of utilizing sequences of random length further comprising atleast four consecutive amino acids, as in SEQ ID NO:4. There is a lack of predictability in the art

regarding the in vivo use of pharmaceutical peptides for sequences with only an intended structure correlation.

Amount of experimentation necessary. Given the unpredictability of the art, and the lack of guidance provided in the specification, one of ordinary skill in the art would be burdened with undue experimentation to make antimicrobial peptides with a tertiary structure correlation for any intended use. If undue experimentation is required to make antimicrobial peptides for any intended use, it would certainly require undue experimentation to determine the "use" of all antimicrobial peptides to determine which would be enabled for pharmaceutical use. This amount of experimentation would be impossible in many lifetimes.

Relative Skill of those skilled in the art. In view of the discussion of each of the preceding seven factors the level of skill in this art is high and is at least that of a Ph.D. with several years of experience in the art. As the cited art would point to, even with a level of skill in the art that is Ph.D. predictability of the results is not invariable.

In consideration of each of the factors 1-8, it is apparent that there is undue experimentation because of variability in prediction of outcome that is not addressed by the present application disclosure, examples, teaching and guidance presented. Absent factual date to the contrary, the amount and level of experimentation needed is undue.

Claim Objection

9. Claim 5 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. The sequence of Thr-Ala-Thr-Val-Thr-Val is free of the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hemant Khanna whose telephone number is (571) 272-9045. The examiner can normally be reached on Monday through Friday, 7:30 am-4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang can be reached on (571) 272-0562. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hemant Khanna Ph. D.
March 05, 2007

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